PATENT ABSTRACTS OF JAPAN

(11)Publication number : **08-263233**

(43)Date of publication of application : **11.10.1996**

(51)Int.Cl. **G06F 3/12**

B41J 29/38

// G06F 13/00

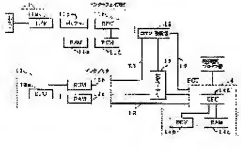
(21)Application number : **07-063173**

(22)Date of filing : **22.03.1995**

(71)Applicant : **SHARP CORP**

(72)Inventor : **KANNO KOUJI**

(54) **IMAGE FORMING DEVICE**



(57)Abstract:

PURPOSE: To shorten processing time by providing a command analytic part for extracting a control command from communication data, analyzing it, dispatching the extracted control command to an interpreter when that command is a control command requiring preprocessing, and dispatching a control command requiring no preprocessing to a control means on the other hand.

CONSTITUTION: A command analytic part 15 classifies received data into image data and various kinds of control commands and performs different kinds of processing corresponding to whether the control command is a printing command or a PCU command. The sorted image data are temporarily stored in a shared memory 12 and it is discriminated by the command analytic part 15 whether the control command is the printing command or the PCU command. When the command analytic part 15 detects a header

showing the PCU command from the received data, numerical data expressing the capacity of data to dispatch the prescribed capacity of following data to a PCU 14 are detected and based on these data, the command analytic part 15 extracts the control command as the PCU command.

[Claim(s)]

[Claim 1] A transceiver means to receive the commo data transmitted from an external device where print data and control command are intermingled, The control means which operates according to the above-mentioned control command, and the interpreter which performs pretreatment which processes control command into the condition which can be processed by the above-mentioned control means, When the control command which extracted, analyzed and extracted control command from commo data is control command to be pretreated, while passing the above-mentioned interpreter Image formation equipment characterized by having the command analysis section which passes the control command which does not need pretreatment to the above-mentioned control means.

[Claim 2] Image formation equipment according to claim 1 characterized by giving the recognition information which shows whether this control command needs pretreatment for the control command in the commo data transmitted from the above-mentioned external device.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any

damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] It connects with information processors, such as a computer, and this invention relates to image formation equipments for carrying out the printout of the information processed with the above-mentioned information processor, such as a printer.

[0002]

[Description of the Prior Art] Conventionally, image formation equipments which receive and carry out the printout of the information processed with information processors, such as a personal computer and a host computer, through a telecommunication cable etc., such as a printer, are known. Moreover, the configuration which used the laser beam printer as the above-mentioned image formation equipment for the purpose of attaining improvement and high-definition-izing of a print speed in recent years spreads widely. Here, an example of the laser beam printer as the above-mentioned conventional image formation equipment is explained.

[0003] Drawing 5 is the block diagram showing the outline of the configuration of the control system with which the above-mentioned conventional laser beam printer is equipped. As the above-mentioned laser beam printer is connected through an information processor, telecommunication cables, etc., such as a personal computer and a host computer, and it is shown in this drawing PCU51 which controls actuation of the whole laser beam printer (Printer Control Unit), It has the electrophotography process section 52 which a laser unit, a photo conductor drum, a development counter, an imprint machine, etc. consist of a well-known configuration, and actually performs printing actuation to a form. In addition, the interface section 53 which performs various kinds of transmit/receive control in order to receive the data processed and transmitted with the above-mentioned information processor, With the shared memory 54 for once storing the data which this interface section 53 received, the received data were taken out from the shared memory 54 one by one, and it has the interpreter 55 analyzed in preparation for next processing.

[0004] Each of the above PCU 51, the interface section 53, and an interpreter 55 is equipped with CPU (Central Processing Unit), ROM (Read Only Memory) the control program which this CPU refers to is remembered to be, and RAM (Random Access Memory) used as work-piece memory etc. in case Above CPU processes, respectively, as shown in this drawing.

[0005] Moreover, the above-mentioned shared memory 54 is RAM shared between the interface section 53 and an interpreter 55, and the above-mentioned interface section 53 and an above-mentioned interpreter 55 exchange data through this shared memory 54.

[0006] In the above-mentioned configuration, it is received by the interface section 53 and the data transmitted from the information processor are once stored in a shared memory 54. An interpreter 55

takes out first the data received from this shared memory 54 picking one by one. While classifying into control command, such as a command which performs selection of a form cassette for performing a condition setup of a printer for the taken-out data with image data, and a command which performs a setup of printing number of sheets Control command is analyzed, it processes developing image data to bit map data according to the contents of this control command etc., and image data and control command are transmitted to PCU51. [finishing / processing]

[0007] In addition, although the above-mentioned control command is intermingled in image data and it is transmitted from an information processor, since the specific sign which shows that it is control command is added according to the specific principle, classifying with the usual image data is possible.

[0008] PCU51 analyzes the control command transmitted from the interpreter 55, and performs image formation by performing setup in the various modes of the electrophotography process section 52, and conditioning (for example, spacing setup etc.) accompanying printing, and controlling the electrophotography process section 52 based on the contents of the control command.

[0009]

[Problem(s) to be Solved by the Invention] However, with the above-mentioned conventional configuration, once all of the image data and control command which were transmitted to the laser beam printer are processed by the interpreter 55, they are passed to PCU51. For this reason, while the processing burden of an interpreter 55 increases, a transfer rate is dependent on the throughput of an interpreter 55. Moreover, even if the control command later transmitted to the place where an interpreter 55 receives a printing command at and is making printing preparations is received, an interpreter 55 cannot process the following control command until printing preparation is completed.

[0010] Therefore, the result that the response to the above-mentioned control command is not obtained is brought until the printing processing based on the above-mentioned printing command is completed, even if the command which asks the condition of the hardware of a laser beam printer from a host computer is transmitted, after a printing command is transmitted. Once getting it blocked, for example, transmitting printing directions from a host computer, it was also impossible to have changed a setup of printing number of copies immediately with the directions from a host computer side.

[0011] As mentioned above, since conventional image formation equipment cannot accept the next directions until the processing under activation is completed by the interpreter, the processing time of the whole equipment is greatly influenced by the throughput of an interpreter, and it has the trouble that it is impossible to perform real time processing also with processing of the control command which does not need processing by the interpreter.

[0012]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the image formation equipment of this invention according to claim 1 A transceiver means to receive the commo data transmitted from an external device where print data and control command are intermingled, The

control means which operates according to the above-mentioned control command, and the interpreter which performs pretreatment which processes control command into the condition which can be processed by the above-mentioned control means, When the control command which extracted, analyzed and extracted control command from commo data is control command to be pretreated, while passing the above-mentioned interpreter, it is characterized by having the command analysis section which passes the control command which does not need pretreatment to the above-mentioned control means.

[0013] Image formation equipment according to claim 2 is characterized by giving the recognition information which shows whether this control command needs pretreatment for the control command in the commo data transmitted from the above-mentioned external device in equipment according to claim 1.

[0014]

[Function] The command analysis section analyzes the control command which the transceiver means received from external devices, such as an information processor, according to the configuration according to claim 1, only the control command which needs to process the condition which can be processed by the control means is passed to an interpreter, pretreatment is performed and the control command which can be processed directly by the control means is directly passed to a control means, without minding an interpreter. In parallel to [the control command later received when the following control command was received while pretreatment of a certain control command is performed / in / by this / the interpreter /, and this control command did not need pretreatment in an interpreter is immediately passed to a control means, and] pretreatment in an interpreter, it will be processed in a control means. Consequently, if it sees from an external device, it will be lost that the time amount which processing of this control command takes is influenced by the throughput of an interpreter about control command without the need of pretreating by the interpreter, and it will become possible to obtain a quicker response.

[0015] According to the configuration according to claim 2, in the commo data transmitted from an external device, the command analysis section judges whether this control command needs pretreatment based on the recognition information given to control command, and while passing an interpreter about the control command which needs pretreatment, it passes a control means directly about the control command which does not need pretreatment. Since the command analysis section is enabled to distinguish the class of control command easily using recognition information while the control command which does not need pretreatment is immediately passed to a control means by this, without going via an interpreter, when it sees from an external device, it becomes possible to shorten further the time amount which processing of the control command which does not need pretreatment takes. Consequently, it becomes possible to shorten further the response time after control command is sent out from an external device until it obtains a processing result.

[0016]

[Example] It will be as follows if one example of this invention is explained based on drawing 1 thru/or drawing 4 . The laser beam printer as image formation equipment in this example is the configuration that it is transmitted to a laser beam printer and the printout of the image data which was mutually connected through the host computer and telecommunication cable as an information processor, and was processed with the host computer is carried out. Moreover, with image data, directions of the user by the side of a host computer etc. are transmitted to a laser beam printer side through the above-mentioned telecommunication cable as control command, and a laser beam printer operates according to such control command.

[0017] First, the outline of the configuration of the above-mentioned laser beam printer is explained, referring to drawing 2 . As shown in this drawing, this laser beam printer as the electrophotography process section for performing an electrophotography process The photo conductor drum 1 and the Maine charger 2 which electrifies the front face of this photo conductor drum 1, The laser beam study system 3 which carries out outgoing radiation of the laser beam modulated based on image data, The polygon mirror 4 which makes the above-mentioned laser beam scan the front face of the photo conductor drum 1 by reflecting a laser beam, rotating, The development unit 5 which develops and forms into a visible image with a toner the electrostatic latent image formed in the front face of the photo conductor drum 1 by exposure of a laser beam, It has the fixing unit 7 grade fixed to a form the imprint unit 6 which imprints the image formed into the visible image by the form, and by heating or pressurizing the imprinted image.

[0018] In addition, it has been arranged at the lower part of a laser beam printer body, and has the sheet paper cassette 8 which feeds paper to a form, the pickup roller 9 which takes out one sheet of form at a time from this sheet paper cassette 8, and the PIN sensor 10 which detects the tip of the form to which paper was fed with the feed roller which is not illustrated. By controlling rotation of the resist roller which is not illustrated based on the detection result of this PIN sensor 10, paper is fed to a form synchronizing with drawing to the photo conductor drum 1 by said laser beam study system 3.

[0019] Next, the outline configuration of each block of the control system established in order to control actuation in each above-mentioned configuration is explained, referring to drawing 1 . The interface section 11 (transceiver means) which performs various kinds of transmit/receive control in order that this laser beam printer may receive image data, control command, etc. which are transmitted from the host computer which is not illustrated, as shown in this drawing, The interpreter 13 which makes analysis, printing preparation, etc. of image data, and PCU14 (control means) which controls actuation of the whole laser beam printer containing the above mentioned electrophotography process section, While having the command analysis section 15 which analyzes the received control command, it has further the interpreter 13, PCU14, and the shared memory 12 that the command analysis section 15 shares.

[0020] Moreover, various kinds of control command is transmitted [Rhine L3 which connects Rhine L2 which connects Rhine L1 which connects the command analysis section 15 and an interpreter 13, and the command analysis section 15 and PCU14, and an interpreter 13 and PCU14 is formed, and] and received through these Rhine so that it may mention later.

[0021] The above-mentioned interface section 11 is equipped with interface 11a, buffer 11b, CPU11c, ROM11d, and RAM11e, and after it takes the synchronization of the transceiver timing by the side of a host computer or it processes removing various kinds of addition data, such as a header to which the data received from the host computer were added by the host computer side at the time of sending out, etc. according to a communications protocol, it carries out sequential sending out to the command analysis section 15.

[0022] The command analysis section 15 classifies the data received from the interface section 11 into two kinds such as the image data printed and various kinds of control command. The command analysis section 15 classifies the above-mentioned control command into two kinds such as a printing command to be pretreated by the interpreter 13, and the PCU command processed directly by PCU14, without needing pretreatment by the interpreter 13 further.

[0023] In addition, the command for controlling directly PCU14 of a laser beam printer from a host computer with the above-mentioned PCU command, The thing of the command for checking the condition of PCU14 from a host computer is pointed out. Or more specifically For example, the command which asks the condition of the hardware of a laser beam printer from a host computer, Various commands, such as a command which requires interruption and reset of printing from the electrophotography process section, a command which is in the middle of printing and changes printing number of copies, a command which changes the font set up as a standard font, and a command which changes a sheet paper cassette, can be mentioned.

[0024] In addition, since the characteristic header which shows that it is the PCU command is added in a host computer and transmitted to the above-mentioned PCU command to a laser beam printer side, the command analysis section 15 can distinguish the PCU command from a printing command by this header. Suppose that "LcLc" is added and transmitted to the head of the PCU command as the above-mentioned header in this example.

[0025] The command analysis section 15 classifies the received data into image data and various kinds of control command as mentioned above, and performs different processing by any with a printing command and the PCU command control command is further. Here, it explains below at a detail, referring to drawing 1 and the flow chart shown in drawing 3 about processing of this command analysis section 15. First, the command analysis section 15 classifies image data and control command from these received data as the interface section 11 receives the data transmitted from the host computer (S2). (it writes like S1 step 1 and the following) In addition, the specific sign which shows that the control command in received data is control command is added, and the command analysis

section 15 can distinguish image data and control command by detecting this sign.

[0026] The image data classified from received data is once stored in a shared memory 12 (S3), and, on the other hand, it is judged by the command analysis section 15 about control command which [of a printing command or the PCU command] it is (S4). In addition, to the PCU command, as mentioned above, the command analysis section 15 can distinguish a printing command and the PCU command by adding the characteristic header "LcLc" to the head.

[0027] If the header "LcLc" which shows that it is the PCU command is detected from the data which the command analysis section 15 received at this time, the data of a subsequent predetermined capacity will be extracted as a PCU command which should be passed to PCU14. Or the numeric data showing the capacity of the data which should be passed to PCU14 is added immediately after the above-mentioned header "LcLc", and you may make it extract the data of capacity with which the command analysis section 15 corresponds according to this numeric data as a PCU command.

[0028] As a result of the judgment in the above-mentioned S4, the command analysis section 15 transmits a printing command to an interpreter 13 through Rhine L1 (S5), and transmits the PCU command to direct PCU14 from the command analysis section 15 through Rhine L2 (S9).

[0029] Here, processing (S6-S8) of the printing command sent to the interpreter 13 in the above S5 is explained first. The printing command sent to the interpreter 13 is analyzed by the interpreter 13, and is once stored in RAM13c of the interpreter 13 interior, or a shared memory 12. Moreover, the image data stored in the shared memory 12 is taken out by the interpreter 13, is changed into the gestalt which was suitable for printing with the printing preparation by the interpreter 13, and is again stored in a shared memory 12 (S6).

[0030] It is as follows when processing of the interpreter 13 in the above S6 is explained more to a detail. First, if the above-mentioned image data is explained, generally [the bit map data which are widely used with the personal computer etc. and which are used by OS (Operating System) which has GUI (Graphical User Interface) based on the concept of WYSIWYG (What You See Is What You Get), or two kinds of character code **s which were assigned to (2) each alphabetic character] as a gestalt of the alphabetic data as image data transmitted from a host computer, it is used recently [(1)]. Moreover, these bit map data and a character code are intermingled, and may be used.

[0031] An interpreter 13 takes out the image data which was transmitted from the host computer with the gestalt of the above-mentioned bit map data and a character code, and was once stored in the shared memory 12 from the above-mentioned shared memory 12. While performing setup of a font, mode setting according to the specification of the electrophotography process section, etc. if needed about bit map data Setup of a font printable about a character code, expansion to bit map data, etc. are performed, the data suitable for actual printing are generated, and it stores in the above-mentioned shared memory 12 again.

[0032] If printing preparations [in / as mentioned above / an interpreter 13] are made and printing

preparation is completed, an interpreter 13 sends out the control command which performs a printing demand to PCU14 through Rhine L3 (S7). When this printing demand was received, the electrophotography process section is started and the electrophotography process section changes into the condition which can be printed, PCU14 takes out the image data stored in the shared memory 12, and outputs it to said laser beam study system 3 of the electrophotography process section. The above-mentioned laser beam study system 3 irradiates the laser beam modulated based on the above-mentioned image data to the photo conductor drum 1 to which the front face is charged in homogeneity with the Maine charger 2. In the above-mentioned photo conductor drum 1, the part exposed in the laser beam is discharged, an electrostatic latent image is formed, after the form to which paper was developed and fed is imprinted and fixed to this electrostatic latent image with a toner after that according to a well-known electrophotography process, it is discharged outside the plane and printing completes it (S8).

[0033] Next, in the above-mentioned S4, processing of the PCU command which was analyzed by the command analysis section 15 and sent to PCU14 is explained below. If the PCU command is received from the command analysis section 15, PCU14 will analyze this PCU command immediately, and will perform processing according to this PCU command (S10). For example, when this PCU command is a command which asks the condition of the hardware of a laser beam printer from a host computer, the condition of hardware is notified to the interface section 11, and it is made to transmit to a host computer. In addition, if PCU14 is monitoring the condition of hardware continuously and the above-mentioned command is passed, it is possible to notify a monitor result to a host computer immediately. Moreover, for example, when this PCU command is a command which changes output number of sheets, PCU14 controls printing actuation of the electrophotography process section so that only the number of sheets set up by this command performs a printout.

[0034] thus, in the laser beam printer in this example In being the printing command with which the command analysis section 15 analyzes this control command, and directs activation of printing when the data which contain control command from a host computer are received Pass this printing command to an interpreter 13, make printing preparations make, and on the other hand, in being the PCU command which should be processed directly by PCU14 By passing direct PCU14 and processing, without minding an interpreter 13, the PCU command can be processed by PCU14 in parallel to the printing preparation made by the interpreter 13.

[0035] Since processing of the PCU command is attained, when it sees from a host computer side, without this waiting to complete processing of an interpreter 13, processing of the transmitted PCU command will be performed quickly. Consequently, the effectiveness of becoming possible to control actuation of a laser beam printer on real time is done so by transmitting the PCU command from a host computer.

[0036] Here, in order to give explanation more intelligible, the processing in this case is explained

with the passage of time, mentioning as an example the case where the PCU command which changes output number of sheets is transmitted, and referring to drawing 4 from a host computer side.

[0037] While a user inputs now the directions which carry out the printout of a certain print data by the laser beam printer with a host computer, suppose that the above-mentioned print data were transmitted (time of day t1 shown all over drawing). In addition, if a user does not specify printing number of copies, especially this laser beam printer shall be initialized so that only the one section may be outputted.

[0038] However, suppose that it remembered that 3 section printout of the above-mentioned print data needed to be carried out after completing the input of the above-mentioned directions of this user (i.e., after transmission of the printing command from a host computer to a laser beam printer is completed) (time of day t2). As shown in this drawing, the interpreter 13 has already started reception and printing preparation for a printing command and the print data which should be printed at this time.

[0039] Here, if a user inputs the directions which change printing number of copies into the three sections from the one section by the host computer side, as the command which changes printing number of copies described above, it will be generated as a PCU command with which the characteristic header was added, and will be transmitted to a laser beam printer from a host computer (time of day t3).

[0040] The above-mentioned PCU command received by the laser beam printer is analyzed in the command analysis section 15, PCU14 is passed immediately, without minding an interpreter 13, shortly after PCU14 receives this command, an interpreter 13 to a printing demand checks not being taken out yet, and printing number of copies is set up with the three sections (time of day t4).

[0041] Then, an interpreter 13 completes printing preparation and outputs a printing demand to PCU14 (time of day t5). Since a setting change of printing number of copies in PCU14 is made at the three sections at this time, PCU14 prints by controlling the electrophotography process section to print the 3 sections of print data (time of day t6).

[0042] The printing preparation in an interpreter 13 requires comparatively long time amount as compared with the air time of the command from a host computer to a laser beam printer, and the processing time of the PCU command in the interior of a laser beam printer. For this reason, although based also on the timing a user instructs modification of printing number of copies to be, while the interpreter 13 is making printing preparations, possibility that printing number of copies can be changed is high.

[0043] As mentioned above, through Rhine L1, if the classified control command is a printing command, if the laser beam printers as image formation equipment in this example are delivery and the PCU command, it will pass them directly to an interpreter 13 through Rhine L2 to PCU14, without making it go via an interpreter 13, while the command analysis section 15 carries out the sequential analysis of the data received from the host computer and classifies image data and control command.

Moreover, an interpreter 13 and PCU14 process according to the passed control command, respectively.

[0044] Even if an interpreter 13 is performing processing of printing preparation etc. by this according to the received printing command, it becomes possible to process the PCU command received after the above-mentioned printing command by PCU14. Consequently, to the control command which does not need the processing in the interpreters 13, such as the PCU command which controls PCU14 directly, if it sees from a host computer, processing of real time will be attained almost. That is, while the response time to the command which asks the condition of the hardware of a laser beam printer from a host computer is shortened for example, it becomes possible from a host computer to perform direct control to PCU14, and improvement in operability can be aimed at.

[0045] In addition, to say nothing of [the above-mentioned example does not limit this invention and] modification various by within the limits of this invention being possible, the configuration which passes control command to each of an interpreter 13 and PCU14 through Rhine from the command analysis section 15 by this example was mentioned as the example, and was explained, but it is also possible to consider as the configuration which passes control command through a shared memory 12. Moreover, although the configuration in which one laser beam printer was connected to one host computer was mentioned as the example and this example explained it, it is also possible to apply this invention to the printer connected to two or more computers, for example in networks, such as LAN.

[0046]

[Effect of the Invention] As mentioned above, the image formation equipment of this invention according to claim 1 A transceiver means to receive the commo data transmitted from an external device where print data and control command are intermingled, The control means which operates according to the above-mentioned control command, and the interpreter which performs pretreatment which processes control command into the condition which can be processed by the above-mentioned control means, When the control command which extracted, analyzed and extracted control command from commo data is control command to be pretreated, while passing the above-mentioned interpreter, it is a configuration equipped with the command analysis section which passes the control command which does not need pretreatment to the above-mentioned control means.

[0047] Since the control command for which the time amount which processing of the control command which does not need pretreatment by the interpreter takes to this does not need pretreatment received later even if an interpreter is performing pretreatment, while being influenced by the throughput of an interpreter is lost can be passed to a control means and can be processed immediately, it becomes possible from an external device to shorten the response time at the time of controlling actuation of image formation equipment by control command. Consequently, it becomes possible to perform control [real time / from an external device], and the effectiveness that the operability of image formation equipment improves is done so.

[0048] Image formation equipment according to claim 2 is the configuration that the recognition information which shows whether this control command needs pretreatment for the control command in the commo data transmitted from the above-mentioned external device is given.

[0049] Since the command analysis section is enabled to distinguish the class of control command easily using recognition information while the control command which does not need pretreatment is immediately passed to a control means by this, without going via an interpreter, when it sees from an external device, the time amount which processing of the control command which does not need pretreatment takes can be shortened further. Consequently, the effectiveness of becoming possible to shorten further the response time after control command is sent out from an external device until it obtains a processing result is done so.

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the outline configuration of the control system with which the laser beam printer in one example of this invention is equipped.

[Drawing 2] It is the sectional view showing the outline configuration of the above-mentioned laser beam printer.

[Drawing 3] It is the flow chart which shows the flow of actuation of the above-mentioned laser beam printer.

[Drawing 4] In the above-mentioned laser beam printer, it is the explanatory view showing the flow of the processing by which printing number of copies is changed.

[Drawing 5] It is the block diagram showing the outline configuration of the control system of the conventional laser beam printer.

[Description of Notations]

11 Interface Section (Transceiver Means)

12 Shared Memory

13 Interpreter

14 PCU (Control Means)

15 Command Analysis Section

[Translation done.]